Developing and Implementing SSIS at Wexford General Hospital; Our Experience

Wexford General Hospital
Foreword

Wexford General Hospital (WGH) achieved a first in the Republic of Ireland when they initiated and utilised a multi-disciplinary formal method of surgical site infection surveillance. This surveillance process enables WGH to identify infection rates in patients following surgery. The data collected through this initiative will allow us to compare our findings with International data.

Surgical Site Infection Surveillance (SSIS) began as a pilot project within the hospital in August 2006. The main aim of the pilot was to assess the process and viability of the SSIS system within the structure of the hospital, using a multi-disciplinary approach. Following a review of the findings, we identified the positive value of the system and consequently it became an established programme in the Department of General Surgery in January 2007.

The system has since been extended into the Department of Obstetrics and Gynaecology where surveillance of patients undergoing caesarean sections is now being completed.

The lessons that WGH learned throughout this process of developing and implementing SSIS have been incorporated into this document.

The various recommendations contained here are set out in an easy-to-follow format. In particular, the intention is to share our experiences with other hospitals who wish to follow in our footsteps. While every healthcare facility operates in its own individual way, the steps taken and the lessons learned by WGH can be transferred and imitated to suit the needs of all healthcare facilities.

I would like to take this opportunity to acknowledge the commitment that our esteemed colleague Mr JB O’Mahony gave to the introduction of this surveillance system to Wexford General Hospital. May he rest in peace.

This book is available online at http://www.hpsc.ie/ and go the Wexford General Hospital link.

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Dr AM O’Byrne MB, MSc, MRCGP, FFPHM I,
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What healthcare professionals have to say about the surveillance system...

’Surgical Site Infections are a major contributor to surgical morbidity and have considerable consequences for patient recovery and hospital economics. The surgical site infection data collected in the Department of Surgery at Wexford General Hospital has allowed us focus on this major outcome marker. While it is heartening to note our SSI rates are roughly comparable with international norms we clearly have room for improvement. These results will allow us target specific areas using a range of interventions with the ultimate goal of improving outcomes for all patients’.

Mr Ken Mealy, MD, FRCS., FRCS (Ed),
Consultant Surgeon
Member of the subcommittee of the National SARI committee,
Wexford General Hospital.

‘Surveillance of healthcare associated infections such as surgical site infections is a key component in the prevention and control of these infections. This comprehensive and informative document of the surgical site infection surveillance programme at Wexford General Hospital, which is lead by the Department of Surgery, represents what can be achieved with multi-disciplinary regional cooperation, and a commitment from hospital management in terms of the appointment of a surveillance coordinator. The document will be of great assistance to other hospitals who wish to establish a similar surveillance programme. I would like to congratulate all concerned with this quality initiative, which will improve patient care and look forward to future initiatives from the group’

Dr Fidelma Fitzpatrick, MRCPI, FRCPath.
Consultant Microbiologist,
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‘The proactive review and audit of healthcare-outcomes is a vital component of the continuing assessment of clinical performance and the maintenance of professional standards. This surveillance of surgical site infections is a very important part of Quality Improvement and shows the commitment of Wexford General Hospital (WGH) to the provision of excellent clinical care to all its patients. I hope the WGH experience will be helpful to other hospitals in their efforts in improve patient care’.

Dr. Colm Quigley,
Consultant Physician and Medical Clinical Director.
Past President, the Medical Council, 2007-2008.
Acknowledgements

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• Mr G Mc Ilvenny
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• Dr F Fitzpatrick M.D., M.R.C.P.I., FRCPath,
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  Beaumont Hospitals, Dublin.
## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Abbreviations</td>
<td>6</td>
</tr>
<tr>
<td>Section 1.0</td>
<td>Wexford General Hospital</td>
<td>7</td>
</tr>
<tr>
<td>Section 1.1</td>
<td>Department of Surgery</td>
<td>7</td>
</tr>
<tr>
<td>Section 1.2</td>
<td>Infection Control Staff</td>
<td>7</td>
</tr>
<tr>
<td>Section 2.0</td>
<td>Impetus to set up SSIS</td>
<td>8</td>
</tr>
<tr>
<td>Section 2.1</td>
<td>Timelines for SSIS Milestones</td>
<td>9</td>
</tr>
<tr>
<td>Section 2.2</td>
<td>Researching SSIS</td>
<td>11</td>
</tr>
<tr>
<td>Section 2.3</td>
<td>Project Management</td>
<td>12</td>
</tr>
<tr>
<td>Section 3.0</td>
<td>Planning Phase Operational Structure</td>
<td>14</td>
</tr>
<tr>
<td>Section 3.1</td>
<td>Project Team</td>
<td>14</td>
</tr>
<tr>
<td>Section 3.2</td>
<td>Pathway of Surveillance Process</td>
<td>15</td>
</tr>
<tr>
<td>Section 4.0</td>
<td>Doing Phase Operational Structure</td>
<td>16</td>
</tr>
<tr>
<td>Section 4.1</td>
<td>Pathway of Surveillance Process</td>
<td>16</td>
</tr>
<tr>
<td>Section 5.0</td>
<td>Checking Phase Operational Structure</td>
<td>18</td>
</tr>
<tr>
<td>Section 6.0</td>
<td>Act Phase Operational Structure</td>
<td>19</td>
</tr>
<tr>
<td>Section 7.0</td>
<td>The SSIS System</td>
<td>21</td>
</tr>
<tr>
<td>Section 7.1</td>
<td>Data Collection Form and Definition of Data Items</td>
<td>21</td>
</tr>
<tr>
<td>Section 7.2</td>
<td>Data Management</td>
<td>21</td>
</tr>
<tr>
<td>Section 8.0</td>
<td>Roles and Responsibilities</td>
<td>23</td>
</tr>
<tr>
<td>Section 9.0</td>
<td>SSIS 2007 Data</td>
<td>27</td>
</tr>
<tr>
<td>Section 10.0</td>
<td>Discussion</td>
<td>28</td>
</tr>
<tr>
<td>Section 10.1</td>
<td>Current Progress</td>
<td>29</td>
</tr>
<tr>
<td>Appendix 1</td>
<td>Clinical Directorate Structure</td>
<td>30</td>
</tr>
<tr>
<td>Appendix 2</td>
<td>Proactive Planning Model</td>
<td>31</td>
</tr>
<tr>
<td>Appendix 3</td>
<td>Key Stakeholders</td>
<td>32</td>
</tr>
<tr>
<td>Appendix 4</td>
<td>Terms of Reference for the Steering Committee</td>
<td>33</td>
</tr>
<tr>
<td>Appendix 4(a)</td>
<td>Steering Committee Membership</td>
<td>34</td>
</tr>
<tr>
<td>Appendix 5</td>
<td>Terms of Reference for the Project Team</td>
<td>35</td>
</tr>
<tr>
<td>Appendix 5(a)</td>
<td>Project Team Membership</td>
<td>36</td>
</tr>
<tr>
<td>Appendix 6</td>
<td>Action Plan</td>
<td>37</td>
</tr>
<tr>
<td>Appendix 7</td>
<td>Inpatient Model Flow Chart</td>
<td>38</td>
</tr>
<tr>
<td>Appendix 8</td>
<td>Data Collection Form</td>
<td>39</td>
</tr>
<tr>
<td>Appendix 9</td>
<td>Isolate Form</td>
<td>41</td>
</tr>
<tr>
<td>Appendix 10</td>
<td>Handbook of CDC definitions</td>
<td>42</td>
</tr>
<tr>
<td>Appendix 11</td>
<td>Bibliography</td>
<td>44</td>
</tr>
</tbody>
</table>
## Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
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<td>ASA</td>
<td>American Society of Anesthesiology</td>
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<td>CDC</td>
<td>Centre for Disease Control</td>
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<tr>
<td>CNS</td>
<td>Clinical Nurse Specialist</td>
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<td>C.Sec</td>
<td>Caesarean Section</td>
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<td>HAI</td>
<td>Hospital Acquired Infection</td>
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<td>HCAI</td>
<td>Healthcare Associated Infection</td>
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<td>HISC</td>
<td>Northern Ireland, Healthcare - Associated Infection Surveillance Centre</td>
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<td>Infection Control Nurse Specialist</td>
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<td>Infection Control Team</td>
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<td>IT</td>
<td>Information Technology</td>
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<tr>
<td>LSA</td>
<td>Lothian Surgical Audit</td>
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<td>MRSA</td>
<td>Methicillin Resistant Staphylococcus Aureus</td>
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<td>NCHD</td>
<td>Non Consultant Hospital Doctor</td>
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<td>Obstetrics/ Gynaecology</td>
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<tr>
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<td>Specialist Registrar</td>
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<tr>
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<td>Surveillance Scientist</td>
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<tr>
<td>SPHM</td>
<td>Specialist in Public Health Medicine</td>
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<td>SSI</td>
<td>Surgical Site Infection</td>
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<td>Surgical Site Infection Surveillance</td>
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<td>WGH</td>
<td>Wexford General Hospital</td>
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<td>WRH</td>
<td>Waterford Regional Hospital</td>
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Introduction

Surgical site infection surveillance (SSIS) is a system whereby post-operative patients are included in a surveillance programme for thirty days after the procedure (one year post implant) to determine if they develop a surgical site infection (SSI). Establishing SSIS was one of the criteria WGH identified in their accreditation process and this document outlines the introduction of the system.

Section 1.0 - Wexford General Hospital

1.1 The Department of Surgery

The Department of Surgery in WGH is composed of three surgical teams led by three consultant surgeons i.e. two general surgeons and one consultant surgeon with responsibility for breast surgery. The theatre suite has two theatres.

Each consultant has a team comprising of a registrar, two senior house officers and an intern. One Specialist Registrar (SpR) works with the two general surgeons.

This unit consists of 58 surgical in-patient beds divided into a 26 bed female ward and a 32 bed male ward and 10 beds in the day ward. The service is supported by nursing staff and allied health care professionals. The department of surgery is managed within the Surgical Clinical Directorate (Appendix 1).

1.2 The Infection Control Staff

The Consultant Microbiologist is based at Waterford Regional Hospital (WRH) and has one session per week at WGH. The Infection Control Nurse Specialist works within WGH but has responsibility for the Wexford geographic area.
Section 2.0 – Impetus To Set Up SSIS

A surgical audit system has been in place in WGH since October 1999 and is based on the Lothian Surgical Audit (LSA). This system comprised of an electronic record for each patient which resulted in improved chart management and also formed a training record for Consultants and Non Consultant Hospital Doctors (NCHDs). However WGH had no formal system of surgical site surveillance, unless the SSI was caused by an “alert” organism such as Methicillin resistant Staphylococcus aureus (MRSA) or group A Streptococcus. Individuals were treated on a case-by-case basis whereby if an infection was suspected, a swab was sent and the patient treated.

The Irish Health Services Accreditation Board surveyed WGH in December 2003. The Board recommended that infection control reporting be formalised to include all surgical wound infections. As a result of this, the General Manager assigned responsibility for investigating SSIS systems to the Quality and Safety Committee and preparation towards implementing SSIS in WGH began. The timelines are outlined below.

SSIS began as a pilot project in August 2006 in WGH and became an established programme in January 2007.
# 2.1 Timelines for SSIS Milestones

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<tr>
<th>Date</th>
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<tr>
<td>December 2003</td>
<td>Irish Health Service Accreditation Board survey of WGH recommends setting up SSIS</td>
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<tr>
<td>April 2004</td>
<td>Irish Health Service Accreditation Board published their report.</td>
</tr>
<tr>
<td>December 2004</td>
<td>Quality and Safety committee charged ICN Specialist to review surveillance systems nationally and internationally.</td>
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<tr>
<td>March 2005</td>
<td>Lead by the ICT in conjunction with ICC, Clinical Risk Manager and the Surgical Directorate a needs analysis was performed and SSIS systems investigated. Site visit to HISC, Belfast, part of the Pan-Celtic surveillance scheme</td>
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<tr>
<td>May 2005</td>
<td>Reports and business case put to Hospital Board of Management</td>
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<tr>
<td>June 2006</td>
<td>Appointment of Project Manager</td>
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<td>August 2006</td>
<td>SSIS Pilot commenced</td>
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<td>November 2006</td>
<td>Pilot Completed</td>
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<td>December 2006</td>
<td>SSIS conference at WGH</td>
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<td>January 2007</td>
<td>SSIS established in WGH</td>
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<td>July 2007</td>
<td>Extended to all Surgical procedures</td>
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<tr>
<td>February 2008</td>
<td>Extended to Caesarean Sections.</td>
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## Timelines for SSIS Milestones

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<tr>
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</thead>
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<tr>
<td>Pilot Project Agreed &amp; Project Manager Appointed</td>
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<td>Site Preparation</td>
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2.2 Researching SSIS

A sub committee, comprising of the infection control clinical nurse specialist; the nurse manager (surgical directorate); the service manager and the clinical risk manager, was established to research SSIS.

The rationale for SSIS is that it is a method of trying to prevent and control SSI by identifying SSIs in a systematic manner using internationally comparable protocols and case definitions. It allows for subsequent planning and intervention to aid control. It provides information on quality of care and allows for the prioritisation in the allocation of resources. Indicators such as SSI rates after surgery are one way of assessing the quality and effectiveness of care (Gaynes and Solomon 1996).

Key facts identified were:

- SSI is recognised as a key outcome indicator after surgery (Bruce et. al., 2001). It has been established that each patient with an SSI requires an additional hospital stay of 6.5 days and hospital costs are doubled (Plowman et. al., 2000)
- Prevalence rates of Hospital Acquired Infection (HAI) are considered to be one of the key outcomes of the local Network Quality Initiatives and are also a key component of the Health Service Executive, Action Plan “Say no to Infection”. (HSE, 2007).

A needs analysis identified that the following criteria were required for a system for WGH:

- Quick and user friendly
- Facilitated a multi-disciplinary team approach
- Required minimal staff training
- Provided a robust system that would allow comparison of data internationally.

The system would need to:

- Monitor the incidence of infection
- Provide early warning of increases in SSIs allowing for planning of control interventions
- Monitor trends, including the detection of outbreaks
- Provide information on the quality of care and prioritise the allocation of resources.
In the absence of a surveillance system in the Republic of Ireland that met the requirements of the needs analysis, international systems were examined. The surgical site infection surveillance system developed by the Healthcare-associated Infection Surveillance Centre (HISC) in the Royal Victoria Hospital, Belfast was investigated. This system uses internationally recognised definitions in its core data sets and is the system of choice of the Pan Celtic Surveillance scheme of which the Rep. of Ireland is a member.

An information and feasibility study was presented to the stakeholders (See appendix 3), this was followed by a business case including the purchase of form recognition software and the appointment of a project manager. This was approved by the Board of Management.

2.3 Project Management:

A Project Manager was appointed in a full time capacity for the duration of an agreed pilot of three months. The person appointed was a senior nurse with managerial and surgical department experience.

The project manager used the following theoretical frameworks to focus the project. The aim of the pilot project was to assess the process and viability of the system within the structure of WGH.

The Proactive Planning Model (Marquis and Huston 2003) (see appendix 2) allowed the project manager to review the past, present and future needs of the project. The past needs have already been outlined, the present need was to introduce SSIS using a multi-disciplinary approach and in the future it would be necessary to evaluate the process at the end of the pilot.

The Deming Model of Continuous Improvement, Plan, Do, Check and Act ‘PDCA’ (1986) was used by the project manager to identify clearly the steps that needed to be taken under the following four phases of (i) Plan (ii) Do (iii) Check (iv) Act.

The project was managed from two aspects:

• Operational Structure
• Pathway of the Surveillance Process

See Figure 1
Implementing A Surgical Site Infection Surveillance System (SSIS) using a Change Management Process

**Aim**
To introduce a SSIS system that would facilitate a multi-disciplinary approach to early identification, prevention and control of surgical site infection (SSI) in an efficient and effective manner.

**PROJECT MANAGEMENT**
Deming Model of Continuous Improvement
‘PDCA’

**PLAN**

- **Operational Structure (O.S.)**
  - Pathway of the Process (P.P.)
  - O.S.: Developed steering committee
  - PP: Developed data collection form

**DO**

- **Operational Structure (O.S.)**
  - Pathway of the Process (P.P.)

**ACT**

- **Operational Structure (O.S.)**
  - Pathway of the Process (P.P.)

**CHECK**

- **Operational Structure (O.S.)**
  - Pathway of the Process (P.P.)

**Action Plan Model**

<table>
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<th>Objective</th>
<th>Actions</th>
<th>Resources Required</th>
<th>Time Frame</th>
<th>Status</th>
</tr>
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</table>

**Levin Change Management Process (1951)**
- Unfreezing
- Movement
- Refreezing
- Denzing Model

**Figure 1**
3.0 Planning Phase Operational Structure

a) Agree a structure/timeframe for the pilot process. Within WGH this timeframe was three months

b) Agree steering committee membership (See appendix 4 a) and terms of reference (see appendix 4).

c) Agree project team membership (See appendix 5a) and terms of reference (see appendix 5)

The patient pathway following surgery within the department of surgery is illustrated below:

The project teams consisted of:

3.1.1 The Operational Team. Once established this team initially met weekly to deal with any practical difficulties and then every two weeks for the duration of the pilot project. This team consisted of the Project Manager, SpR, Theatre Manager, Nurse Manager Surgical Directorate, Consultant Microbiologist and the Infection Control Nurse Specialist. The value of this team was two-fold: firstly in addressing the practical difficulties as they arose and secondly in establishing areas of responsibility and in building working relationships which have continued.
3.1.2 A Data Group was established comprising of the Project Manager, IT Technician, Specialist in Public Health Medicine, Surveillance Scientist and (from November 07) a Clerical Assistant. The main functions of this group were to modify the SSIS audit form according to local needs and to address operational issues as they arose e.g. difficulties with scanning, in exporting data, gaps in data etc.

3.1.3 A Laboratory Operational Group was set up in April 07. This comprised of the Laboratory Bench Manager, Consultant Microbiologist, laboratory Surveillance Scientist and Project Manager. The outcome of the deliberations were that the Project Manager contacted the laboratory when a swab was sent on an individual with a suspected SSI and the laboratory ensured an early full work up was done on this swab.

3.1.4 Pathway of Surveillance Process

a) Agree patient group.
b) Agree content of data collection form.
c) Agree day-to-day organisation of the form.
d) Agree scheduled meetings and feedback plan for the following groups of staff: clinical staff, steering group, project team. It was agreed that steering group meetings would be held monthly on the same day of the week each month to facilitate attendance. The project team met every two weeks initially. Feedback to the surgical teams and clinical department heads would consist of an annual report and six monthly summary reports.

Lessons learned “Planning Phase”

- Have a clear structure in place with clear terms of reference for the Steering Committee and the Project Team to reduce the risk of ambiguity of roles amongst the membership.
- Have regular focused meetings to facilitate problem solving
- Agree clear timeframes for feedback of findings to the staff involved
Section 4.0 – Doing Phase Operational Structure

Steering committee meetings were held monthly using the Office for Health Management, Action Plan Model (2003) (see appendix 6). This model enabled the meetings to be conducted in a focused and efficient manner. The project team met every two weeks. The aim of these meetings was to facilitate problem solving and the decision making process using a top down bottom up approach.

4.1 Pathway of Surveillance Process

a) Training of the project manager and the IT analyst: The Formic software company provided a two-day training course for the project manager and the information analyst.

b) Develop and agree pathway of surveillance process with the surgeons: This involved the clinicians deciding to store the form in theatre in order to ensure the maximum compliance in form completion, the completed forms are collected from theatre by the surveillance manager and cross checked against the emergency surgery diary and the elective theatre list. This allows continuous monitoring of compliance in completion of the data collection forms. The surveillance manager brings the forms to the appropriate wards where the forms are placed in the patient’s case notes by the ward clerks. On the patients discharge the forms are removed from the patient case notes by the ward clerks and returned to the surveillance manager/surveillance office.

c) Agree selection of patient group for inclusion in the surveillance pilot: nine procedures were selected for the pilot.

d) Clearly identify individual roles within the process i.e. doctors, nurses, public health department, IT and clerical staff

e) Develop and agree data collection form i.e. core data and local data. It was important to ensure clarity amongst the clinicians on the core data and its importance and purpose while making them aware of the ability of the system to collect local data. It was agreed to keep local data to a minimum during the pilot process

f) Staff awareness sessions: Agree awareness campaign for relevant staff, doctors, nursing and clerical staff attended these.
• **Medical Staff:** The nurse manager of the project and ICN specialist attended the surgical conference to educate the NCHDs on the surveillance process, form completion and the CDC definitions.

• **Nursing Staff:** Through consultation with the department heads it was decided that these sessions would take place in the clinical areas to maximise attendance. All staff were provided with pocket handbooks containing the CDC definitions to allow them easy reference to the definitions of an SSI (See appendix 10 and 10a). All relevant clinical areas and doctors’ offices were supplied with laminated A4 size definitions of an SSI. Handouts explaining the surveillance process, day-to-day organisation of the form and the CDC definitions were distributed.

• **Clerical Staff:** The ward clerks and the medical records department supervisor were informed of the day-to-day administration of the form and their role within surveillance. A written log of all staff that attended these sessions was maintained.

g) **Data Management:** Management of data was agreed between the project manager, department of public health and the information analyst.

---

**Lessons learned “Doing Phase”**

• Meetings need to be focused and efficient with all members clear on their roles, responsibilities and tasks to be completed.

• If a member was unable to attend a scheduled meeting then he/she would update the SSIS manager prior to the meeting.

• Focus on a small number of patients in the pilot process.

• Keep local data to a minimum on data collection form

• Develop a process, which allows data cleaning, and report writing to be completed within the agreed timeframes.

• Education of all staff is essential with a clear identification of roles and learning needs

• Communication and continued daily support from the Project manager to all groups of staff is necessary to ensure awareness and compliance
Section 5.0 – Checking Phase Operational Structure and Pathway of Surveillance Process

In this phase, the main steps were

a) Progress of form completion and compliance monitored daily by the Project Manager

b) Problems identified were discussed at the operational team meetings weekly and feedback to the Steering Committee

c) Data analysis completed

d) Feedback of data findings to the key stakeholders

Lessons learned “Checking Phase”

• Continuous monitoring of the level of completion of forms and feedback to staff (both positive and negative) is necessary for good quality data

• Regular team meetings are crucial in the early stages of the process to identify problems that occur at different stages involving different departments and staff in different ways. The expertise of the staff present at the meeting helped to solve problems.

• It is necessary to have a trained data analyst. Good communication links between the IT, Project Manager and Data Analyst are crucial to provide reports on time.

• Time must be allocated to doctors and nurses to get feedback and reports
Section - 6.0 Act Phase

The main steps in this phase were:

• Completion of data analysis and sharing the report with all staff involved in collecting the data

• The decision to extend the surveillance process to all surgery within WGH

• Education sessions for all relevant staff to inform them of the progression of surveillance

• The process of setting up SSIS and the results of the pilot were shared with colleagues at a conference hosted by WGH in December 2006

See Figure 2 (page 20)

Lessons learned “Acting Phase”

• Timely dissemination of results to staff is crucial

• Sharing of plans for the future is essential in order to gain compliance.
**SSI’S ARE ONE OF THE MOST PREVENTABLE ADVERSE EVENTS IN SURGERY**

(Committee on Quality of Healthcare in America, 2000)

**HCAI**

Healthcare Associated Infection

(National Nosocomial Infection Surveillance (NNIS) 2000)

**Wexford General Hospitals Approach To Improving Quality & Reducing Risk**

Introduction of Surgical Site Infection Surveillance System (SSIS)

**Deming Model of Continuous Improvement ‘PDCA’**

- **PLAN**
  - Cross Functional Teams Formed
  - Needs Analysis Completed
  - Project Manager Appointed
  - Surveillance System chosen that allows international data comparisons.

- **DO**
  - Practice Planning Model used (Margulis & Heat 2003)
  - Overseen by Project Manager in Association With Steering Committee, Comprising OF Multi Disciplinary Membership
  - Surveillance Plan Project Initiated To Assess the Effectiveness of the Change Management Process Within An Agreed Time Frame

- **CHECK**
  - Ongoing Model Of Continuous Improvement And Action Plan Model From The Office For Health Management Used During The Plan Phase Ensured A Clear, Focused Vision And Progression

- **ACT**
  - Education Of Relevant Staff Ensured A High Level Of Compliance To Data Collection
  - Ongoing Evaluation Of The Project By The Project Manager And The Steering Committee

**REFERENCES**


- American Journal of Infection Control 28, p429y448

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**Figure 2**
Section 7.0 - The SSIS System

Day to day organisation of surveillance (see appendix 7)

7.1. Data Collection Form and Definition of Data Items

A form for data collection was drawn up based on that already in use by the Northern Ireland Healthcare - Associated Infection Surveillance Centre (HISC), as part of the Pan Celtic group. This form is attached as Appendix 8.

The core data definitions and wound classification are those developed by the Centre for Disease Control, these definitions are also used by the Pan Celtic surveillance group. The core data set cannot be changed or amended in any way if international benchmarking of findings is to be achieved. These definitions are available at www.cdc.gov

Some local data items were included on the data collection form. This allows the clinical teams to collect information of interest to them. However, it is prudent to restrict local data items to a minimum in the initial phases.

Pathogens and antibiotic sensitivities are collected on a separate form. (Appendix 9)

Note:
•   Core data set: Agreed set of uniform definitions and questions that allows comparison with other hospitals.

•   Local data set: Hospital specific surveillance questions.

7.2 Data Management

The Public Health Department HSE-SE agreed to analyse the data and write reports. Data were exported initially from Formic to EXCEL and later to SPSS (Analysis Software Package). Data cleaning was undertaken prior to analysis: in the pilot phase the surveillance scientist contacted the Project Manager when errors were noted and these were checked and corrected to improve data quality.
Data analysis was undertaken using SPSS. To protect patient confidentiality, data transfer was through a dedicated secure HSE network and databases were stored on a secure hard drive, which was backed up nightly. The Specialist in Public Health Medicine and the Surveillance Scientist undertook data validation, data analysis and report writing, including feedback to Clinicians.

**Feedback to Clinicians involved:**

**Surgical Teams:**
- Monthly provision of data on SSI’s
- Provision of six monthly summary report
- Provision of annual report
- Each surgeon is provided with a detailed analysis of the SSI’s which occurred in patients admitted under their care.
- Attendance at surgical conference

**Clinical Nurse Manager 3, Clinical Nurse Manager 2, Clinical Nurse Manager 1 and Clinical Nurse Specialists:**
- Provision of the six monthly summary report
- Provision of annual report
- Attendance at CNM 2 forum meetings twice a year
- Provision of workshops for staff
Section 8.0 - Roles and Responsibilities

Hospital General Manager:
- Chairperson of Steering Committee
- Senior level commitment to the project from the outset
- Allocation of resources as required by the project
- Organisational knowledge

Director of Nursing:
- Member of the Steering Committee
- Strategic development of care standards.
- Professional development and support of nursing staff involved in multidisciplinary quality projects.

Project Manager:
The person appointed to this post was in a full time capacity and was a senior nurse with managerial and surgical department experience in WGH.
- To coordinate and manage the Steering Committee and ward and theatre operational aspects in parallel
- To deliver specific training sessions for each of the groups involved e.g. Doctors, Nurses, Ward Clerk and Medical records staff. Also to maintain a daily presence at ward/theatre for informal discussion
- Cross-checking forms against theatre lists to ensure that forms on all eligible patients are captured: This is a daily task involving liaison with the ward staff and medical records department
- Feedback is provided to the Surgeons on forms that have not been completed
- Organising the collection of the forms and scanning into a database
- Liaising with IT and the data analyst as queries arise
- Liaising with the laboratory when a swab is sent to ensure early laboratory work up
- Effective management of meetings with agreed agendas and timelines for actions
- Worked with Project group and Nurse Manager and Heads of Departments to problem solve and implement necessary changes
Nurse Manager:
- Member of the Steering Committee
- Liaison and facilitation between departments in order to anticipate and resolve problems and issues raised
- Link regularly with Project Manager between Steering Committee and Project Group meetings to resolve any problem / issues
- Specific working knowledge of theatre and wards
- Identification of nursing resources required to meet education sessions
- Liaison with Clinical Nurse Managers to plan and implement any necessary changes to facilitate initiative.

Infection Control Nurse Specialist:
- Member of the Steering Committee
- Liaise with the project manager when SSIs are identified
- Discuss the SSI with the Consultant Microbiologist
- Complete isolate data collection form in conjunction with the consultant microbiologist
- Monitor infection trends
- Provide expert advice to the steering committee
- Collaborate with the surgical teams to investigate best practice initiatives.

Information Technology Analyst:
- Design of Questionnaire/Database; Advice on Hardware and backup systems
- Member of the Steering Committee
- Formation of questionnaire using Formic
  (Above was done in conjunction with Project Manager)
- Scanning of Completed Forms
  (This task has been handed over to clerical officer)
• Cleaning of Collected Data; Correcting of entries where Formic misread forms
• Exporting dataset to Public Health

(This task has been handed over to clerical officer)
• Maintenance and Support
• Adding questions and sections to forms
• Resolving version problems and compatibility issues raised by Formic
• Software support for Formic
• User support for clerical users of Formic

Consultant microbiologist:
• Member of the Steering Committee
• Advise in conjunction with the clinical surgical and nursing staff e.g. in practical interpretation of CDC definitions of infection, categorization of type of surgery e.g. clean/contaminated/dirty etc
• Liaise with the laboratory staff to check the cultures and ensure that identification and sensitivity testing is performed
• Liaise between microbiology laboratory and clinical staff once an infection diagnosed post-operatively. The Surveillance Manager or Infection Control Nurse informs the Consultant Microbiologist of patients that are presumed to have an infection and are having samples sent to the laboratory. The Consultant Microbiologist will then discuss the patient with one of the clinical team (usually the SpR) and advise on appropriate antibiotic management etc
• Consult with the ICN who completes the microbiology laboratory section of the surveillance form and returns it to the surveillance office for scanning
• Provide feedback to clinical and laboratory staff on the results
• Utilises the surveillance data to suggest ways of further minimising risk of infection to patients e.g. introduction of pre-operative MRSA screening for breast surgery patients; working with newly appointed antibiotic pharmacist to set up an audit of antibiotic prophylaxis with an aim to improve same.
Department of Public Health:
Specialist in Public Health Medicine

Surveillance Scientist
• Members of the SSIS Steering Committee and providing expert advice to the project
• Advice on data items for collection and form design
• Data cleaning and compilation
• Data analysis
• Report writing
• Feedback and discussion with surgeons and Steering Group

Specialist Registrar-Higher Surgical Trainee:
• Attendance at all SSIS Steering Committee meetings as a representative of the surgical teams
• Link between the Steering committee and the other surgical NCHD’s
• Link with the project manager for day to day problems
• Support to other surgical NCHD’s to fill in forms
Section 9.0 – SSIS 2007 Data

- In 2007, 62 SSIs were recorded in 691 patients. The crude SSI rate was 9% (Table 1).
- More women had procedures (n=399) than men (n=292). However 60% of SSIs occurred in men (n=37).
- Age ranged from 3 years to 90 years. The SSI rate was highest in those over 75 at 16.7%.
- The commonest procedures performed were cholecystectomy (194) and appendicectomy (144). Colon (75) and small bowel surgery (22) accounted for 50% of SSIs.
- SSI rates were higher in emergency procedures, in open procedures and in those who had general anaesthesia.
- SSI rate was 3.9% in clean wounds rising to 25.7% in dirty/infected wounds.
- SSI rate increased as ASA category increased from 5.2% in healthy patients to 100% in moribund patients (n = 2).
- A risk score was assigned to each patient based on the individual’s ASA category, length of surgery and wound classification. Sixty six percent of patients scored 0 (no risk of infection). SSI rate increased as the risk score increased.
- A variety of microorganisms was identified including 2 MRSA isolates.
Section 10. - Discussion

- Surveillance is multi-disciplinary and local ownership is crucial. The aim of SSIS is not simply to collect numbers but to provide a framework for continuous improvement.

- The role of the surveillance manager is multi-faceted. It involves
  - Efficient data management
  - Liaison between all stakeholders
  - Provision of continuous feedback to staff
  - Implementation of agreed action plans to facilitate effective problem solving and timely intervention
  - It involves insuring continuous and systematic surveillance
  The presence of this role is seen as an essential component to the continuous success of surveillance

- SSIS at WGH provides detailed hospital specific feedback on SSI rates which is of value to patients, surgical and nursing staff and managers.

- SSIS has the ability to recognise potential infection trends

- SSIS will reduce the risk of potential adverse outcome

- Surgical teams use the process and data to evaluate contributing factors to SSI

- SSIS facilitates collaboration between the Infection Control department and Surgical Directorate to mirror international best practice initiatives e.g. SSI care bundles

- SSIS can facilitate the reduction of SSIs therefore improving the quality of patient care and outcomes, resulting in a reduction in the length of patient stay and reduction in healthcare costs

- The system follows the same methodology as the Pan Celtic group and collects additional microbiological data. Further data on prophylaxis and antibiotic treatment will be collected in 2008
• The system allows WGH’s data to be compared with those of other hospitals internationally.

10.1 Current Progress:

• SSIS is conducted on all surgical procedures with the exclusion of day cases

C/Section SSIS Pilot Project

• C Section surveillance has been introduced into the department of obstetrics / gynaecology

• The pilot of SSIS of C Sections was commenced in April 2008 for a three month time period. The aim of this pilot is to ensure the clinicians are cognisant of the value of compliance with the system and to identify any deficits in data collection. A programme will then be put in place to address any areas of concern.

• Data analysis and a report of the pilot initiative will be delivered to all stakeholders in September / October 2008. Data collection is ongoing.

Pharmacists Role

• Since January 2008 a pharmacist has joined the Steering Committee

• This pharmacist follows all patients who develop a surgical site infection using the new pharmacy section of the form record and look at the antimicrobial agent(s) used for prophylaxis and to record length of prophylaxis.

• The pharmacist also records on the form the antibiotics used to treat the SSI and for how long this treatment was continued.

• The new pharmacy section of the surveillance form will serve a dual purpose. It will allow audit of adherence to the antibiotic policy in the area of surgical prophylaxis and allow examination of the choice of antibiotics in the treatment of surgical site infections and compare this with best practice
Appendix 1: Clinical Directorate Structure

### Medical Clinical Directorate
- Director
- Nurse Manager
- Service Manager
- Support Staff
- Specialist Teams

<table>
<thead>
<tr>
<th>Medical Clinical Directorate Specialist Teams</th>
<th>Surgical Clinical Directorate Specialist Teams</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Team</td>
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<td>Accident &amp; Emergency</td>
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<td>CSSD</td>
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<td>ICU</td>
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<td>Obstetrics &amp; Gynaecology</td>
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<td>Outpatients Department</td>
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<td>Paediatrics</td>
<td>Theatre User Group</td>
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<td>Palliative Care</td>
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<td>Pharmacy</td>
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<td>Physiotherapy</td>
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<td>Radiology</td>
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<tr>
<td>Respiratory</td>
<td></td>
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<tr>
<td>Speech &amp; Language</td>
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</tbody>
</table>
Appendix 2: Proactive Planning Model

Proactive Planning

Past

Present

Future
Appendix 3: Key Stakeholders

• Consultant Surgeons
• General Management
• Nursing Management
• Network Manager
• Infection Control Department
• Microbiology Department
• Accreditation Department
• Clinical Risk Department
• Information Technology Department
• Department of Public Health.
Appendix 4: Terms of Reference Steering Committee

Steering Committee for the Introduction of a Surgical Site Infection Surveillance System

Terms of Reference

Aim of Committee
- Oversee the introduction of SSIS monthly meetings to monitor progress and ensure objectives are being met.
- To ensure local ownership of the surveillance system.
- To ensure an integrated approach to the introduction of the system.
- To agree an approved plan for the Steering Committee.
- To agree and approve a realistic timeframe for the introduction of the project.
- To agree and approve a framework for the feedback of findings to clinicians and management.
- To set up project team to implement the surveillance system

Project Team Membership
- Project Surveillance Manager
- Consultant Microbiologist
- Specialist Registrar
- Nurse Manager Surgical Directorate
- Infection Control Nurse Specialist
- Clinical Nurse Manager 3 in theatre

Thursday 25th May 2006
Appendix 4(a): Steering Committee Membership

Steering Committee Membership

- Mr R Dooley, Network Manager
- Ms T Hanrahan, General Manager
- Mr B Finnegan, Director of Nursing
- Ms R Pierce, Assistant Director of Nursing, Surgical Directorate
- Ms P Hackett, Service Manager
- Ms E Ward, Infection Control Nurse Specialist
- Dr D Keady, Consultant Microbiologist (May 2006-March 2007)
- Dr B Carey, Consultant Microbiologist (December 2007)
- Ms N Walsh, Surveillance Scientist, Waterford Regional Hospital (April 2007-November 2007)
- Dr C O’Hare, Surveillance Scientist, Public Health Dept, HSE-South (SE)
- Dr A M O’Byrne, Specialist in Public Health Medicine, HSE-South (SE)
- Ms Z Martin, Specialist Register / General Surgery (July 2006 - June 2007)
- Dr J Mulson, Specialist Register / General Surgery (July 2007 – June 2008)
- Mr S Butler, IT Manager
- Mr N Power, Information Technology Analyst
- Ms F Furlong, CNM 3, Theatre
- Ms R O’Leary, CNM 2, Theatre
- Ms C Murray, Clinical Risk Manager
- Ms Mgt Curran, Quality Manager
- Ms E O’Sullivan, Project Surveillance Manager
- Ms Y Hennessy, Pharmacist
- Mr J B O’ Mahony, Consultant Surgeon
- Mr K Mealy, Consultant Surgeon. Member of the subcommittee of the National SARI committee.
Appendix 5: Terms of Reference for the Project Team

**Aim:** Ensure the successful implementation of the pilot project for surgical site infection surveillance to Wexford General Hospital within the framework agreed by the Steering Committee

In order to facilitate clarity these draft terms of reference will be laid out under the following headings (i) Introduction (ii) Compliance (iii) Feedback.

**Introduction:**
- To ensure a multi-disciplinary approach to problem solving at operational level.
- Agree a timeframe for the project team meetings that is realistic and achievable. (Suggestion that these meetings will take place on alternate weeks commencing Friday 21st July 06)
- The Project Manager to provide education to staff. All nursing and medical staff to attend awareness sessions and staff attendance recorded.
- Identified problems that cannot be solved by the project team will be brought to the Steering Committee meetings to facilitate problem solving throughout the life of the project.

**Compliance:**
- Daily review of the form by the Project Manager for the duration of the pilot project.
- Identification of problems and feedback of the problems to the project team to agree actions needed. It is the responsibility of all members of the project team to try and solve these problems. Evidence of all actions will be found in the minutes of the project team meetings.
- The Project Manager will attempt to ensure continued awareness and education amongst staff around the project, whilst maintaining a daily presence within the surgical departments.

**Feedback:**
- Provide feedback to staff on the progress of the project at the following forum’s CNM2 meetings, surgical conference meetings, education sessions and link nurses.
- Feedback of all stages of the pilot project will be provided to the Steering Committee.

July 14th 2006
Appendix 5 (a): Project Team Membership

- Ms E O’Sullivan (Project Manager)
- Dr D Keady (Consultant Microbiologist)
- Dr Z Martin (Specialist Registrar)
- Ms R Pierce (Nurse Manager)
- Ms E Ward (Infection Control Nurse Specialist)
- Ms Furlong (CNM 3 Theatre)
### Appendix 6:

**Action Plan** (Office for Health Management 2003)

**Goal:** Efficient progression of the SSIS within WGH

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Activities To Be Undertaken</th>
<th>Resources Required</th>
<th>Target Date</th>
<th>Review Date and Method</th>
<th>Date Objective Met</th>
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</tbody>
</table>
Appendix 7: The Wexford General Hospital Inpatients Model (Day to Day Organisation) Flow Chart 2008

Forms stored in theatre, Surveillance Manager provides stock of forms to Theatre

All medical staff obtain the forms from Theatre Reception, as required

Demographic details and operative details, eg, ASA score, wound class, completed by medical staff in Theatre

The completed forms are collected from Theatre and placed in the case notes by the Surveillance Manager.

If an SSI is suspected, ward staff/medical staff inform the Surveillance Manager

The Surveillance Manager visits or contacts the ward regularly to monitor progress

The Surveillance Manager informs the Laboratory group of the impending specimen to ensure an early full work-up

Surveillance Manager liaises with the ICN and informs her that an SSI is identified/suspected

An isolate form is originated by the Surveillance Manager and given to the ICN for completion. The completed form is returned to the Surveillance Manager for scanning

Completed data collection form is returned to the Surveillance Manager by the ward clerk at the time of the patient’s discharge/transfer/death
# Appendix 8: Data collection form for general surgery

## Surgical Site Infection Surveillance For General Surgery

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
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<tbody>
<tr>
<td>Surname</td>
<td>Block Capitals</td>
</tr>
<tr>
<td>Forename</td>
<td>Block Capitals</td>
</tr>
<tr>
<td>Q1 Chart Number</td>
<td>W</td>
</tr>
<tr>
<td>Q2 Gender</td>
<td>Male</td>
</tr>
<tr>
<td>Q3 Date of birth</td>
<td>D</td>
</tr>
<tr>
<td>Q5 Patient weight in Kg's.</td>
<td>Kg's</td>
</tr>
<tr>
<td>Q6 Patient Height in cm's:</td>
<td>Cm's</td>
</tr>
<tr>
<td>Q4 Ward</td>
<td>St Pat's</td>
</tr>
<tr>
<td>Q8 Date of admission</td>
<td>D</td>
</tr>
<tr>
<td>Q9 Date of procedure</td>
<td>D</td>
</tr>
<tr>
<td>Q7 Operation</td>
<td>Elective</td>
</tr>
<tr>
<td>Q10 Anaesthesia</td>
<td>Local</td>
</tr>
<tr>
<td>Q11 Endoscopic Approach</td>
<td>Yes</td>
</tr>
<tr>
<td>Q12 Wound Class</td>
<td>Clean</td>
</tr>
<tr>
<td>Q13 ASA Classification</td>
<td>Normally healthy patient</td>
</tr>
<tr>
<td>Q14 Procedure</td>
<td>Appendicectomy (1h)</td>
</tr>
<tr>
<td>Q15 Was Implant Used?</td>
<td>Yes</td>
</tr>
<tr>
<td>Q16 Was there more than one procedure performed through the same incision during the same trip to theatre?</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Chart Number
W

Q17 Principally performed by
Consultant ☐ Special Registrar ☐
Registrar ☐ SHO ☐

Q18 Time of incision (24 hour clock)

Q19 Did the consultant assist in surgery if he was not the primary surgeon?
☐ Yes ☐ No

Q20 Time of closure (24 hour clock)

Q21 Consultant responsible: If "Other", please specify.
JBOM ☐ ET ☐
KM ☐ Other ☐

Q22 Was the patient given antibiotic prophylaxis?
☐ Yes ☐ No

Q23 If the answer to Q22 is "yes", please state which agent was used.
☐ Co-amoxiclav ☐ Gentamycin
☐ Cefuroxime ☐ Teicoplanin
☐ Metronidazole ☐ Other - Please state →

Surgical Site Infection (SSI)

Q24 Was a specimen from the SSI sent to the lab?
☐ Yes ☐ No

Q25 Surgical site infection (SSI)
When SSI is diagnosed, contact the project office on ext 3136.
☐ Yes ☐ No

Q26 Type of SSI
Superficial ☐ Deep ☐ Organ space ☐
Breast abscess/mastitis ☐ Interabdominal ☐

Q28 Date infection diagnosed
D D M M Y Y Y

Q29 Was the ICN contacted regarding SSI?
☐ Yes ☐ No

Q30 Outcome
□ Death ☐ Transfer ☐ Discharge ☐

Q31 Date of Outcome.
D D M M Y Y Y

Q32 Was person readmitted with an SSI?
☐ Yes ☐ No

Mr. Mealy's Team
Was wound protector used for laparotomy?
☐ Yes ☐ No
### Appendix 9 - Data Collection Form General Surgery

#### ISOLATE INFORMATION

<table>
<thead>
<tr>
<th>Q33 Chart Number</th>
<th>Patient ID</th>
</tr>
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<tbody>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Q34 Date of specimen</th>
<th>Q35 Was 1st Isolate considered clinically significant?</th>
<th>Q36 Was 2nd Isolate considered clinically significant?</th>
</tr>
</thead>
<tbody>
<tr>
<td>D D M M Y Y Y</td>
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<td>□ Yes □ No</td>
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<tr>
<th>Q37 Type of specimen received</th>
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<tbody>
<tr>
<td>□ Blood culture</td>
</tr>
<tr>
<td>□ Tissue, organs, bone</td>
</tr>
<tr>
<td>□ Drainage from organ space</td>
</tr>
<tr>
<td>□ Incisional site drainage</td>
</tr>
<tr>
<td>□ Swab</td>
</tr>
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<td>□ Other specimens</td>
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<tr>
<th>Q38 Pathogens</th>
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<tbody>
<tr>
<td>Methicillin Sen S. aureus</td>
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<tr>
<td>Methicillin Res S. aureus</td>
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<tr>
<td>Coag neg staphylococci</td>
</tr>
<tr>
<td>Group A streptococcus</td>
</tr>
<tr>
<td>Other streptococci</td>
</tr>
<tr>
<td>Enterococcus</td>
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<tr>
<td>Citrobacter spp.</td>
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<tr>
<td>E. Coli</td>
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<tr>
<td>K. pneumoniae</td>
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<tr>
<td>Proteus</td>
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<tr>
<td>S. marcescens</td>
</tr>
<tr>
<td>Coliform spp.</td>
</tr>
<tr>
<td>Serratia spp.</td>
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<td>Acinetobacter spp.</td>
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<tr>
<td>Pseudomonas aeruginosa</td>
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<tr>
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<tr>
<td>Anaerobes</td>
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<tr>
<td>Other Bacteria</td>
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<td>Candida albicans</td>
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<td>Other candida spp.</td>
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<tr>
<td>Bacillus spp.</td>
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<td>Enterobacter spp.</td>
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<td>Kelbsiella spp.</td>
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<td>Amikacin</td>
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<td>Amoxicillin</td>
</tr>
<tr>
<td>Cephradine</td>
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<tr>
<td>Cefotaxime</td>
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<tr>
<td>Ceftazidine</td>
</tr>
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<td>Erythromycin</td>
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<td>Fusidic Acid</td>
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<tr>
<td>Gentamicin</td>
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<td>Rifampicin</td>
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<tr>
<td>Taz/Pip</td>
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<tr>
<td>Teicoplanin</td>
</tr>
<tr>
<td>Tetracycline</td>
</tr>
<tr>
<td>Tobramycin</td>
</tr>
<tr>
<td>Trimethoprim</td>
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<tr>
<td>Vancomycin</td>
</tr>
<tr>
<td>Linezolid</td>
</tr>
<tr>
<td>Coamoxiclav</td>
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<td>Coamoxiclav</td>
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<td>Extra 1</td>
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</tbody>
</table>

Respondent 1 Printed on 17/04/2008

Jan - June 08 Project 013
Appendix 10: - Pocket Size Handbook of CDC Definitions

**Superficial SSI (Incisional)**
A superficial SSI must meet the following criterion:
Infection occurs within 30 days after the operative procedure

And
Involves only skin and subcutaneous tissue of the incision

And
Patient has at least one of the following:
- Purulent drainage from the superficial incision
- Organisms isolated from an aseptically obtained culture of fluid or tissue from the superficial incision
- At least one of the following signs and symptoms of infection: pain or tenderness, localized swelling, redness, or heat, and superficial incision is deliberately opened by surgeon and is culture positive or not

**Superficial SSI (Incisional) (contd)**
Cultured. A culture-negative finding does not meet this criterion

- Diagnosis of superficial incisional SSI by the surgeon or attending doctor

The following are not reported as superficial incisional SSI:
- Stitch abscess (minimal inflammation and discharge confined to the points of suture penetration)
- Infected burn wound
- If the incisional site infection involves or extends into the fascial and muscle layers, report as deep incisional SSI.

**Classify infection that involves both superficial and deep incision sites as deep incisional SSI**

**Deep SSI (Incisional)**
A deep incisional SSI must meet the following criterion:
Infection occurs within 30 days after the operative procedure if no implant (#) is left in place or within one year if implant is in place and the infection appears to be related to the operative procedure

And
Involves deep soft tissues (e.g. fascial and muscle layers) of the incision

And
Patient has at least one of the following:
- Purulent discharge from the deep incision but not from the organ/space component of the surgical site
- A deep incision spontaneously dehisces or is deliberately opened by a surgeon and is culture-positive or not cultured when the patient has at least one of the following signs or

**Deep Incisional Contd**
Symptoms: fever (.38 degree C), or localized pain or tenderness. A culture-negative finding does not meet this criterion

- An abscess or other evidence of infection involving the deep incision is found on direct examination, during re-operation, or by histopathological or radiological examination
- Diagnosis of a deep incisional SSI by a surgeon or attending doctor

Classify infection that involves both superficial and deep incision sites as deep incisional SSI.

(#) A non-human-derived implantable foreign body (e.g. prosthetic heart valve, non-human vascular graft, or hip prosthesis) that is permanently placed in a patient during surgery
**Organ/Space SSI**
An organ/space SSI involves any part of the body, excluding the skin incision, fascia, or muscle layers that is opened or manipulated during the operative procedure. An organ/space must meet the following criterion:
Infection occurs within 30 days after the operative procedure if no implant is left in place or within one year if implant is in place and the infection appears to be related to the operative procedure

*And*
Infection involves any part of the body, excluding the skin incision, fascia, or muscle layers, that is opened or manipulated during the operative procedure

*And*
Patient has at least one of the following
- A purulent drainage from a drain that is placed through a stab wound into

**Organ/Space SSI (contd)**
The organ/space
- Organisms isolated from an aseptically obtained culture or tissue in the organ/space
- An abscess or other evidence of infection involving the organ/space that is found on direct examination, during the operation, or by histopathological or radiological examination
- Diagnosis of an organ/space SSI by a surgeon or attending doctor

Occasionally an organ/space infection drains through the incision. Such an infection generally does not involve re-operation and is considered a complication of the incision. Therefore, classify as a deep incisional SSI.
Appendix 11:

Bibliography


Reference List


